

Figure 1: Screening libraries of chimeric promoter sequences

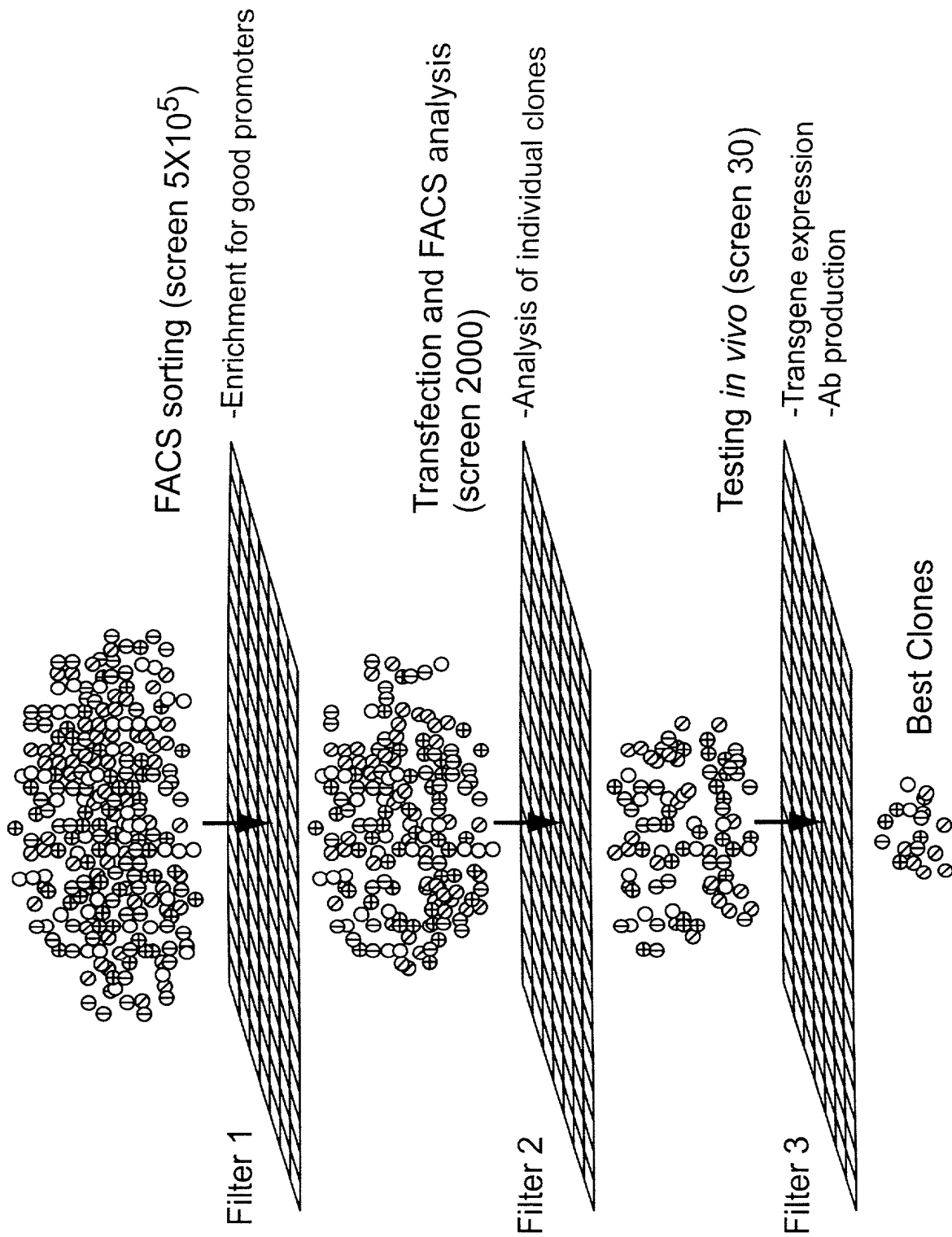
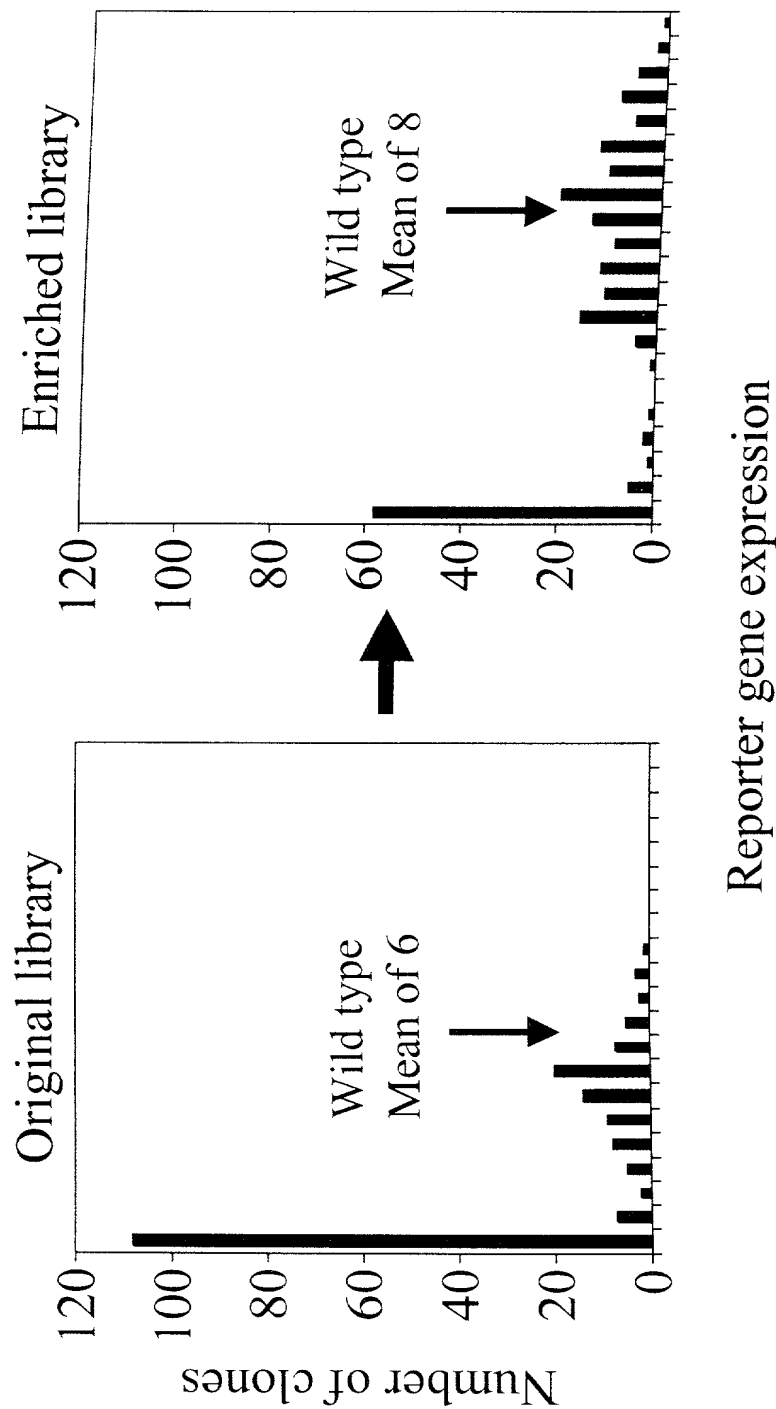
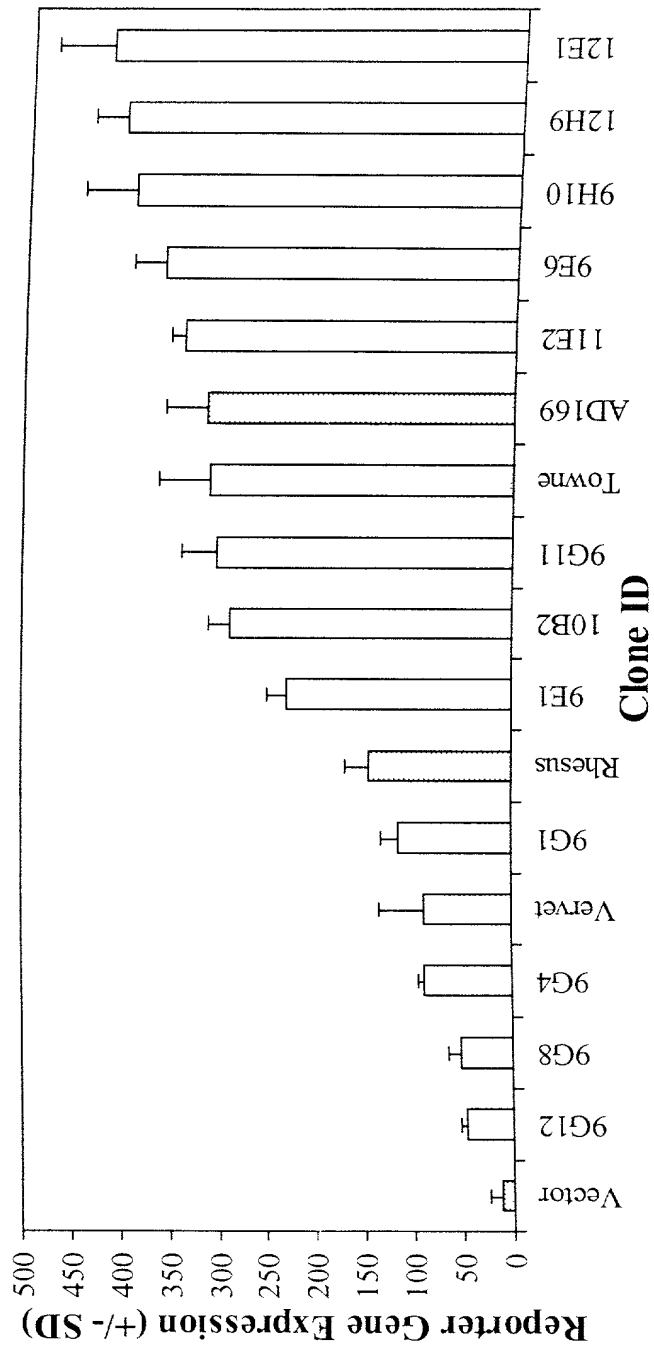


Figure 2: Enrichment of chimeric promoter libraries by FACS sorting



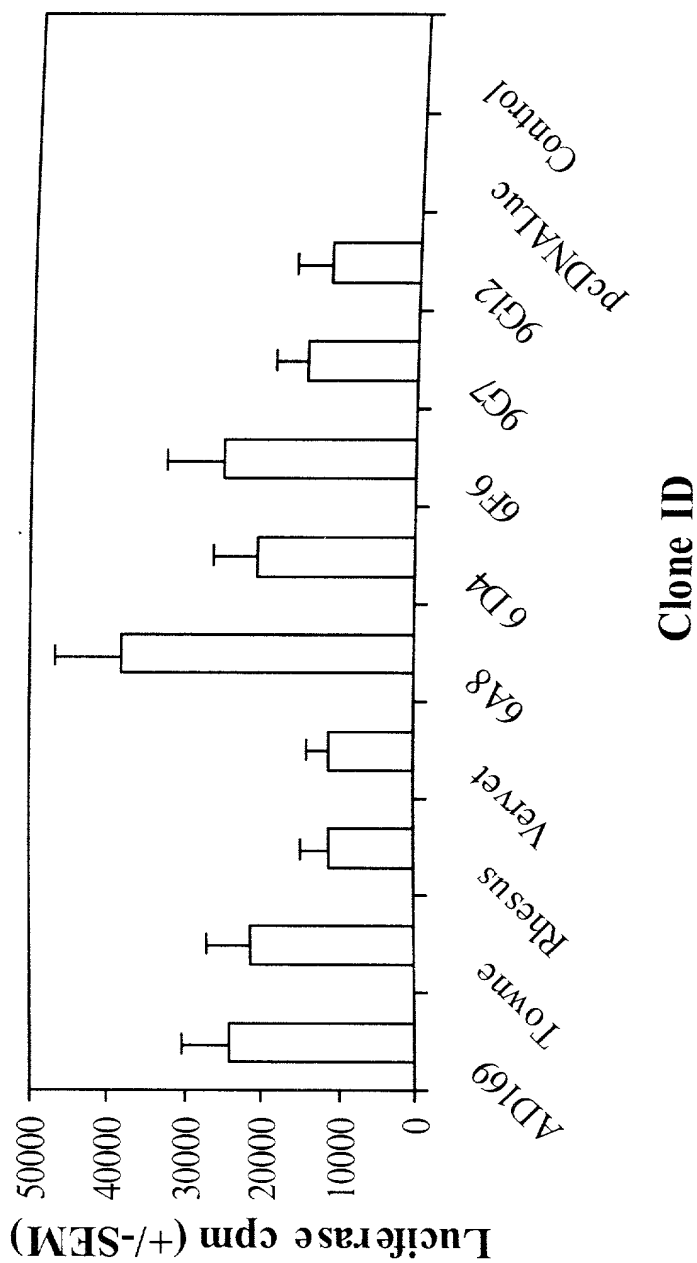
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**Figure 3: Diverse activities of chimeric promoter sequences in transfected cells**



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Figure 4: Luciferase expression in muscle 7 days after plasmid injection



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Figure 5: Comparison of Luciferase expression from clone 6A8 and parental clones

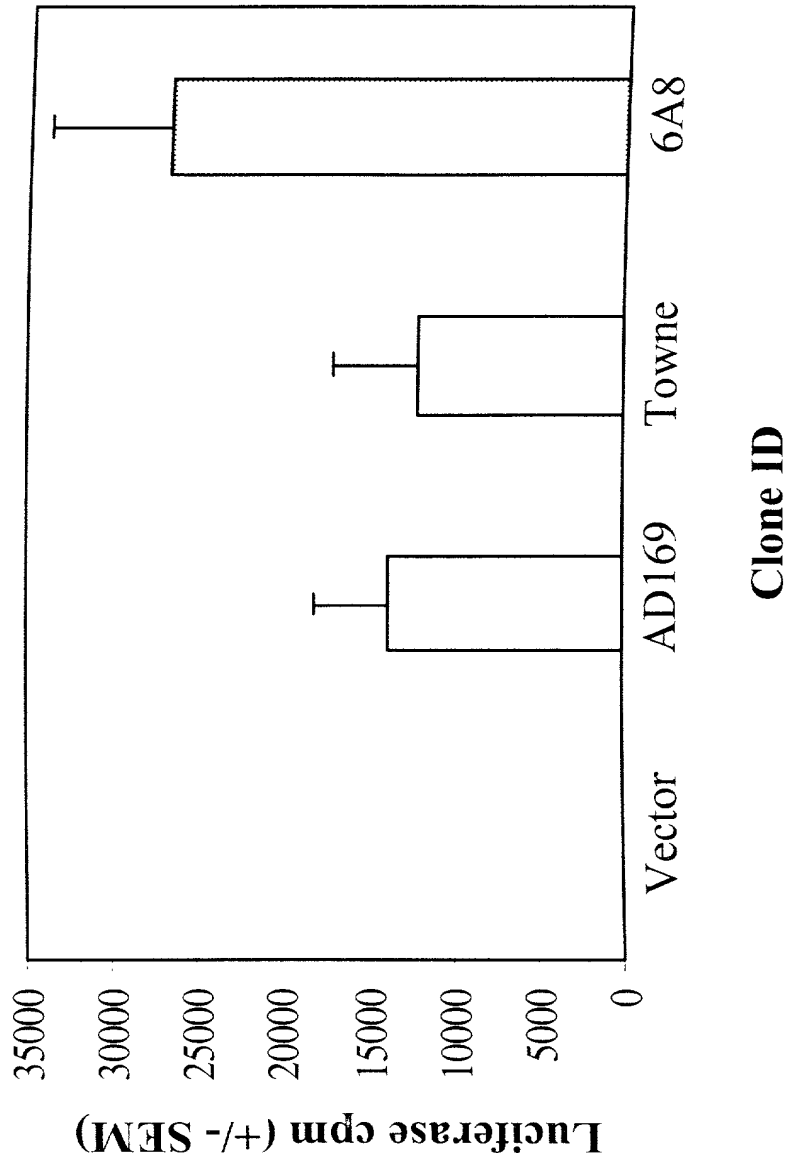


Figure 6A: Antibody responses following injection with  $\beta$ -galactosidase-encoding plasmid

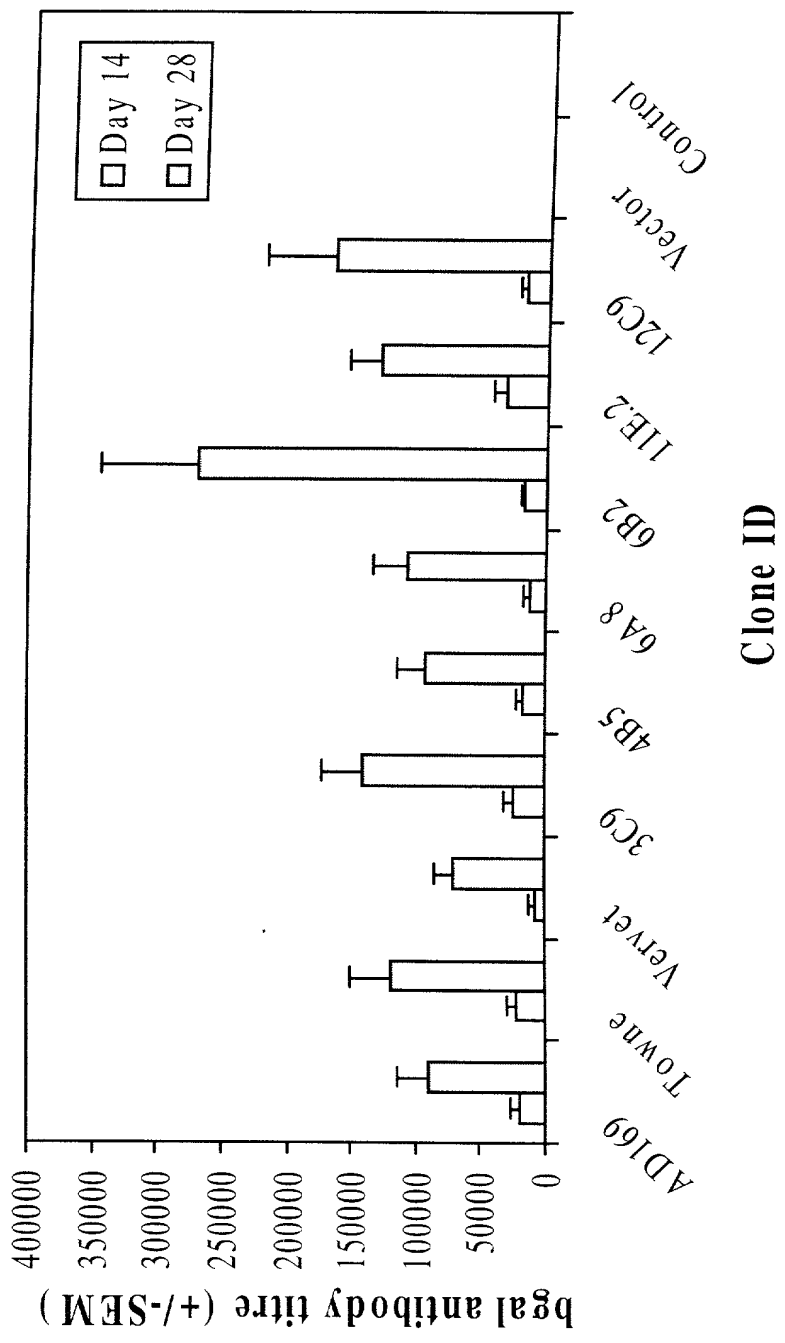


Figure 6B: Improved Ab Response by Shuffled Promoter

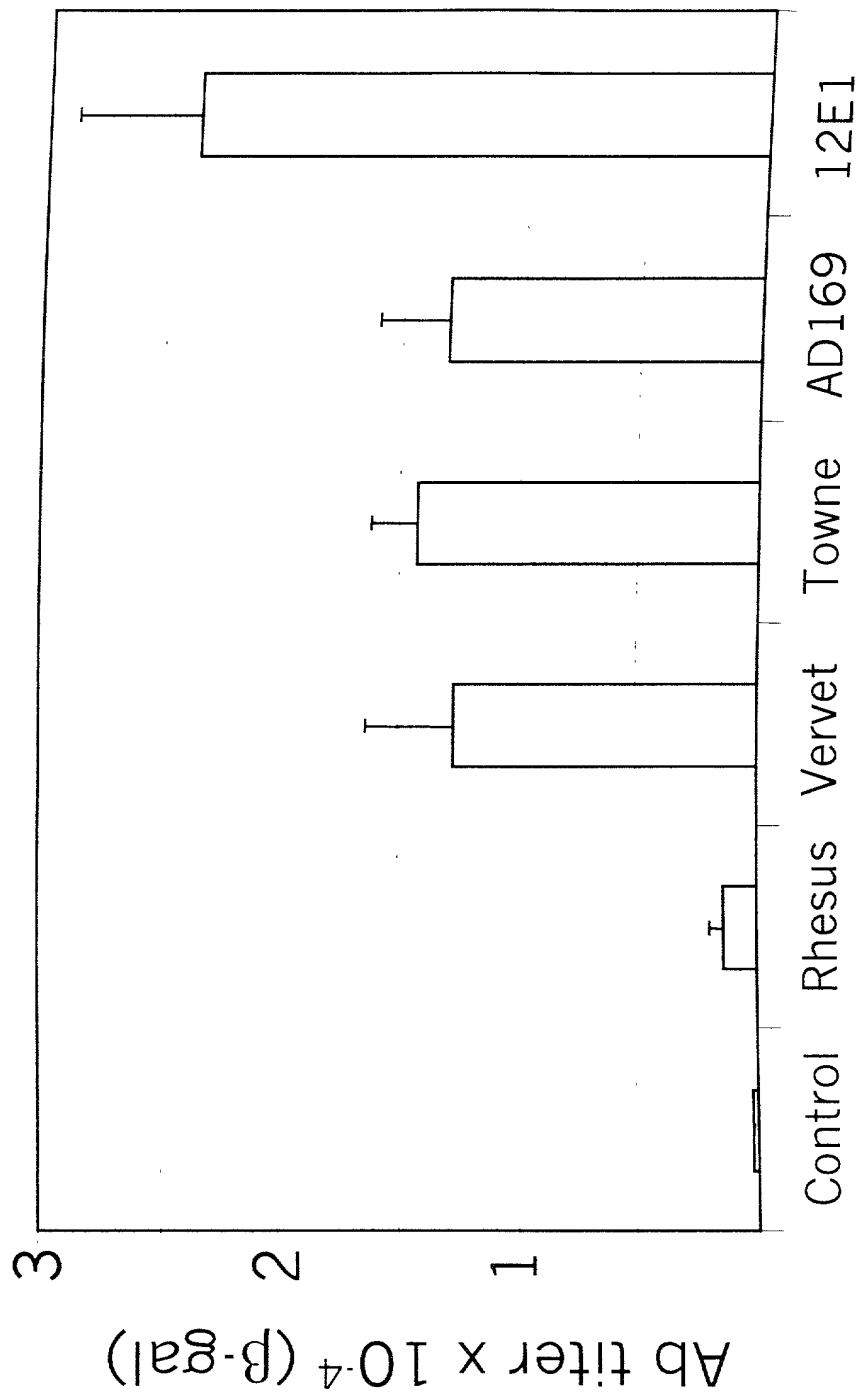
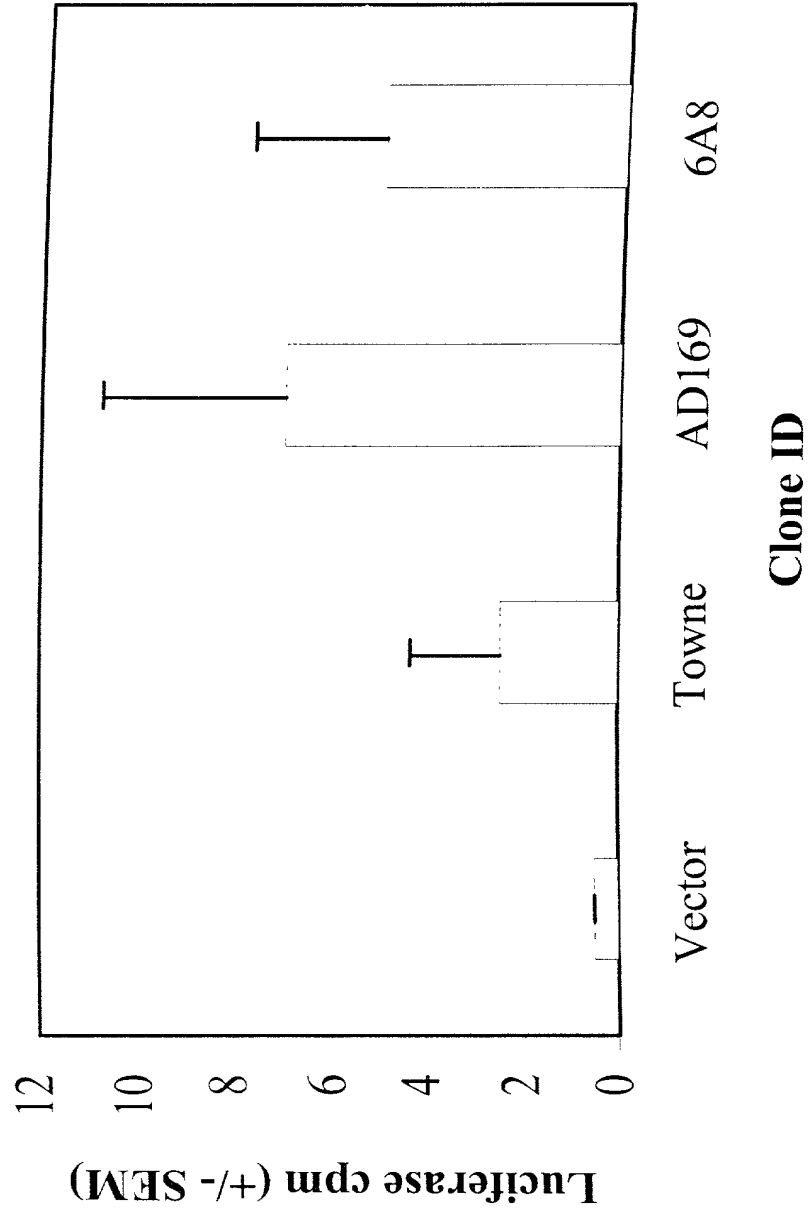


Figure 7: Chimeric promoter 6A8 is functional in human muscle tissue



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Figure 8A: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	1	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	100
11B2	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
12C9	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
12E1	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
12H9	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
3C9	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
4B5	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
6A8	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
6B2	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
6D4	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
6F6	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
9E1	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
9F11	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
9G11	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
9G12	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
9G4	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
9G7	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
9G8	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
AD169	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
Towne	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
Consensus	(1)	ATATGAGGCTATATCGCCGATAGAGGGGACATCAAGCTGGCACATGGCAATGCATATCGATCTATACATTAATCAATATTGGCAATTAGCCATATTG	
10B2	200	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	200
11B2	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
12C9	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
12E1	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
12H9	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
3C9	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
4B5	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
6A8	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
6B2	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
6D4	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
6F6	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
9E1	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
9F11	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
9G11	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
9G12	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
9G4	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
9G7	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
9G8	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
AD169	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
Towne	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	
Consensus	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAAATGTACATTTATATTGGCTCATGTCCAATAG	

Figure 8B: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

	201	300
10B2	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
11E2	(201)	ACTGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
12C9	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
12E1	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
12H9	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
3C9	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
4B5	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
6A8	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
6B2	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
6D4	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
6F6	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
9E1	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
9F11	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
9G11	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
9G12	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
9G4	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
9G7	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
9G8	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
AD169	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
Towne	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
Consensus	(201)	ACGCCCATGTTGACATTGATTGACTAGTATTAAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAACTT
	301	400
10B2	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
11E2	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
12C9	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
12E1	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
12H9	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
3C9	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
4B5	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
6A8	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
6B2	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
6D4	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
6F6	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
9E1	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
9F11	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
9G11	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
9G12	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
9G4	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
9G7	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
9G8	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
AD169	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
Towne	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT
Consensus	(301)	ACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCGCCCGCCCATTTGACGTCAATATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATT

Figure 8C: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
11E2	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCTCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
12C9	(401)	GACGTC	CAATGGGTGGGATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
12E1	(401)	GACGTC	CAATGGGTGGGATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
12H9	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
3C9	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCGCCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
4B5	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
6A8	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
6B2	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
6D4	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
6F6	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
9E1	(319)		-----		-----
9F11	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
9G11	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
9G12	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
9G4	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
9G7	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
9G8	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACG-CCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
AD169	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCGCCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
Towne	(400)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCGCCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
Consensus	(401)	GACGTC	CAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTCCGCCCCCTATTGACGTC	CAATGACGTC	CAATGACGTC
	501				600
10B2	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGGCTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
11E2	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGTAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
12C9	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
12E1	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
12H9	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
3C9	(501)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
4B5	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
6A8	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
6B2	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
6D4	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
6F6	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
9E1	(319)		-----		-----
9F11	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
9G11	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
9G12	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
9G4	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
9G7	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
9G8	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
AD169	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
Towne	(500)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			
Consensus	(501)	AATGGCCCGCCTGGCATTATGCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTACGTAATAGTATAGTATGCTATACCATGGTATGCG			

Figure 8D: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	(600)	GTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCCATGTGACGTCAATGGGAGTTTGT	700
11E2	(600)	GTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
12C9	(600)	GTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
12E1	(600)	GTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
12H9	(600)	GTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
3C9	(601)	GTTTGGCGGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
4B5	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
6A8	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
6B2	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
6D4	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
6F6	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
9E1	(407)	GTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
9F11	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
9G11	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
9G12	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
9G4	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
9G7	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
9G8	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
AD169	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
Towne	(600)	GTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
Consensus	(601)	GTTTGGCAGTACACCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCAAAGTCTCCACCCATTGACGTCAATGGGAGTTTGT	
10B2	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	800
11E2	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
12C9	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
12E1	(683)	-----CGGTCTATGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
12H9	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
3C9	(701)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
4B5	(683)	-----CGGTCTATGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
6A8	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
6B2	(683)	-----CGGTCTATGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
6D4	(683)	-----CGGTCTATGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
6F6	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
9E1	(507)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
9F11	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
9G11	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
9G12	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
9G4	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
9G7	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
9G8	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
AD169	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
Towne	(700)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	
Consensus	(701)	AATCAACGGGACTTTCACCAATGTCGTAATAACCCCGCCCGCTTGACGCAATGGGCGGTAGGCGGTGACGGTGGAGGTCCTATATAAGCAATGCTCGTT	

Figure 8E: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	(800)	TAGTGAACCGT	CAGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	CATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	900
11E2	(800)	TAGGGAACCG	CCATTCTG	CGTGGGACGC - - - - - CGGAG - - - - -	GAGTCCAT	TGAAGAGAC	CGGGACCG	ATCCAGCT	CCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
12C9	(800)	TAGGGAACCG	CCATTCTG	CGTGGGACGC - - - - - CGGAG - - - - -	GAGCACCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCAGCT	CCGCGGC	CGGGAAC	CGGTGCA		
12E1	(748)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
12H9	(800)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
3C9	(801)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
4B5	(748)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
6A8	(800)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
6B2	(748)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
6D4	(748)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
6F6	(800)	TAGTGAACCG	CCATTCTG	CGTGGGACGC - - - - - CGGAG - - - - -	GAGCACCAT - AGAAGTAC	CGGGACCG	ATCCAGCT	CCAGCT	CCGCGGC	CGGGAAC	CGGTGCA		
9E1	(607)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
9F11	(799)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
9G11	(800)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
9G12	(800)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
9C4	(800)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
9C7	(800)	TAGGGAACCG	TGATCGCCT	GGGAGC - - - - - TCGGAG - - - - -	GAGCACCAT - AGAAGTAC	CGGGACCG	ATCCAGCT	CCAGCT	CCGCGGC	CGGGAAC	CGGTGCA		
9G8	(800)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
AD169	(799)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
Towne	(800)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT - AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA	
Consensus	(801)	TAGTGAACCG	TGATCGCCT	GGAGACGC	CATCCAC	CGTGT	TTTGACCTCCAT	AGAAGACAC	CGGGACCG	ATCCAGCT	CCGCGGC	CGGGAAC	CGGTGCA
10B2	(899)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
11E2	(890)	TTGGAACCG	GGATTCC	CGGTGCCGAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
12C9	(889)	TTGGAACGC	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
12E1	(847)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
12H9	(899)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
3C9	(900)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
4B5	(847)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
6A8	(899)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
6B2	(847)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
6D4	(847)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
6F6	(889)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
9E1	(706)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
9F11	(898)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
9G11	(899)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
9G12	(899)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
9C4	(899)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
9G7	(889)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
9G8	(899)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
AD169	(898)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
Towne	(899)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG
Consensus	(901)	TTGGAACCG	GGATTCC	CGGTGCCAAGAG	TGACGTA	AGTAC	CGCCTATAGACTCT	ATAGGCAC	ACCCCTTT	TGGCT - CTTAT	GCATGC	TATAC	TACTGTTTTTGG

Figure 8F: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	1100
11E2	(989)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
12C9	(898)	-----	
12E1	(947)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
12H9	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
3C9	(999)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
4B5	(946)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
6A8	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
6B2	(946)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
6D4	(946)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
6F6	(988)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
9E1	(805)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
9F11	(996)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
9G11	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
9G12	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
9G4	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
9G7	(988)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
9G8	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
AD169	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
Towne	(998)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	
Consensus	(1001)	CTTGGGGCTATACACCCCGCTTCTTATGCTATAGGTGATGGTATAGCTTAGCCTATAGGTGTTGGTTATTTGACCAATATTGACCACTCCCTATTGG	1101
10B2	(1098)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	1200
11E2	(1089)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAGCTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
12C9	(898)	-----	
12E1	(1047)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
12H9	(1098)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
3C9	(1099)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
4B5	(1046)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
6A8	(1098)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
6B2	(1046)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
6D4	(1046)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
6F6	(1088)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
9E1	(905)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
9F11	(1096)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
9G11	(1098)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
9G12	(1098)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
9G4	(1098)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
9G7	(1088)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
9G8	(1098)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
AD169	(1098)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
Towne	(1097)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	
Consensus	(1101)	TGACGATACCTTTCCATTACTAATCCATAACATGGCTCTTTGGCCAACTATCTCTATTGGCTATATGCCAATACTCTGTCTCTTCAGAGACTGACACGGAC	



Figure 8G: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	1198	TCTGTATTTTACAGGATGGGGTCCCAATTATTTATTTACAAATTCACATATACAAACACCGTCCCGTCCCGCAGTCTTTTGTAAACATAGCGTGG	1201
11E2	1189	TCTGTATTTTACAGGATGGGGTCTCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	1301
12C9	1898	TCTGTATTTTACAGGATGGGGTCCCAATTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
12E1	1147	TCTGTATTTTACAGGATGGGGTCCCAATTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
12H9	1198	TCTGTATTTTACAGGATGGGGTCTCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
3C9	1199	TCTGTATTTTACAGGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
4B5	1146	TCTGTATTTTACAGGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
6A8	1198	TCTGTATTTTACAGGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
6B2	1146	TCTGTATTTTACAGGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
6D4	1146	TCTGTATTTTACAGGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
6F6	1188	TCTGTATTTTACAGGATGGGGTCTCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
9E1	1005	TCTGTATTTTACAGGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
9F11	1196	TCTGTATTTTACAGGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
9G11	1198	TCTGTATTTTACAGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
9G12	1198	TCTGTATTTTACAGGATGGGGTCTCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
9C4	1198	TCTGTATTTTACAGGATGGGGTCTCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
9G7	1188	TCTGTATTTTACAGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
9G8	1198	TCTGTATTTTACAGGATGGGGTCTCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
AD169	1198	TCTGTATTTTACAGGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
Towne	1197	TCTGTATTTTACAGGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
Consensus	1201	TCTGTATTTTACAGGATGGGGTCCCAITTTATTTACAAATTCACATATACAAACGCGTCCCGTCCCGCAGTCTTTTATTAACATAGCGTGG	
10B2	1298	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	1401
11E2	1289	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
12C9	1898	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
12E1	1247	GATCTCCACGCGAAATCTCGGGTACGTGATCCGGACATGGGGCTCTTCTCCGTTAGGGTGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
12H9	1298	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGTGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
3C9	1299	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
4B5	1246	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
6A8	1298	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGTGGGGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
6B2	1246	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGTGGGGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
6D4	1246	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
6F6	1288	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
9E1	1105	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
9F11	1296	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
9G11	1298	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
9G12	1298	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
9C4	1298	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
9G7	1288	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
9G8	1298	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
AD169	1298	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
Towne	1297	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	
Consensus	1301	GATCTCCACGCGAAATCTCGGGTACGTGTTCCGGACATGGGGCTCTTCTCCGTTAGGGCGGAGCTTCCACATCCGAGCCCTGGTCCCATGCTCCAGCGGC	

Figure 8H: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

	1401		1500
10B2	(1398)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
11E2	(1389)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
12C9	(898)	-----	-----
12E1	(1347)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
12H9	(1398)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
3C9	(1399)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
4B5	(1346)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
6A8	(1398)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
6B2	(1346)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
6D4	(1346)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
6F6	(1388)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
9E1	(1205)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
9F11	(1396)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
9G11	(1398)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
9G12	(1398)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
9G4	(1398)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
9G7	(1388)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
9G8	(1398)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
AD169	(1398)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
Towne	(1397)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
Consensus	(1401)	TCATGGTCGCTCGGCAGCTCCTTGTCTCTTAACAGTGGAGGCCAGACTT	AGGCACAGCACAATGCCACACACACAGTGTGCCGCAAAAGCCGTGGCGG
	1501		1600
10B2	(1498)	TAGGGTATGTGTGTAATAATGAGCTCGGAGATTGGGCTCGCACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
11E2	(1489)	TAGGGTATGTGTGTAATAATGAGCTCGGAGCTTGGGCTCGCACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
12C9	(898)	-----	-----
12E1	(1447)	TAGGGTATGTGTGTAATAATGAGCTCGGAGATTGGGCTCGCACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
12H9	(1498)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
3C9	(1499)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
4B5	(1446)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
6A8	(1498)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
6B2	(1446)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
6D4	(1446)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
6F6	(1488)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
9E1	(1305)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
9F11	(1496)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
9G11	(1498)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
9G12	(1498)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
9G4	(1498)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
9G7	(1488)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
9G8	(1498)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
AD169	(1498)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
Towne	(1497)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT
Consensus	(1501)	TAGGGTATGTGTGTAATAATGAGCTCGGAGTTGGGCTTGGCAACCGCTGACG	AGATGGAAGACTTAAAGGCAGCGGCAGAGAAGATGCAGGCAGCTGAGT



Figure 8I: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	(1598)	TGTTGTAATCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	1601
11E2	(1589)	TGTTGTAATCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
12C9	(898)	-----	
12E1	(1547)	TGTTGTAATCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	1700
12H9	(1598)	TGTTGTAATCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
3C9	(1597)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
4B5	(1546)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
6A8	(1598)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
6B2	(1546)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
6D4	(1546)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
6F6	(1588)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
9E1	(1405)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
9F11	(1596)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
9G11	(1598)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
9G12	(1598)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
9G4	(1598)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
9G7	(1588)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
9G8	(1598)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
AD169	(1598)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
Towne	(1596)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	
Consensus	(1601)	TGTTGTTCTCTGATAAGAGTCAGAGGTAACCTCCGTTGCGGTGCTGTTAACCGTGGAGGCGAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGCGCC	1770
10B2	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
11E2	(1689)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
12C9	(898)	-----	
12E1	(1647)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
12H9	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
3C9	(1697)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
4B5	(1646)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
6A8	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
6B2	(1646)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
6D4	(1646)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
6F6	(1688)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
9E1	(1505)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
9F11	(1696)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
9G11	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
9G12	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
9G4	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
9G7	(1688)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
9G8	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
AD169	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
Towne	(1696)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	
Consensus	(1701)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCCCTTCCATGGGTCTTTCTGCAGTCAACCGTCCCTT	

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## Vector for promoter evolution

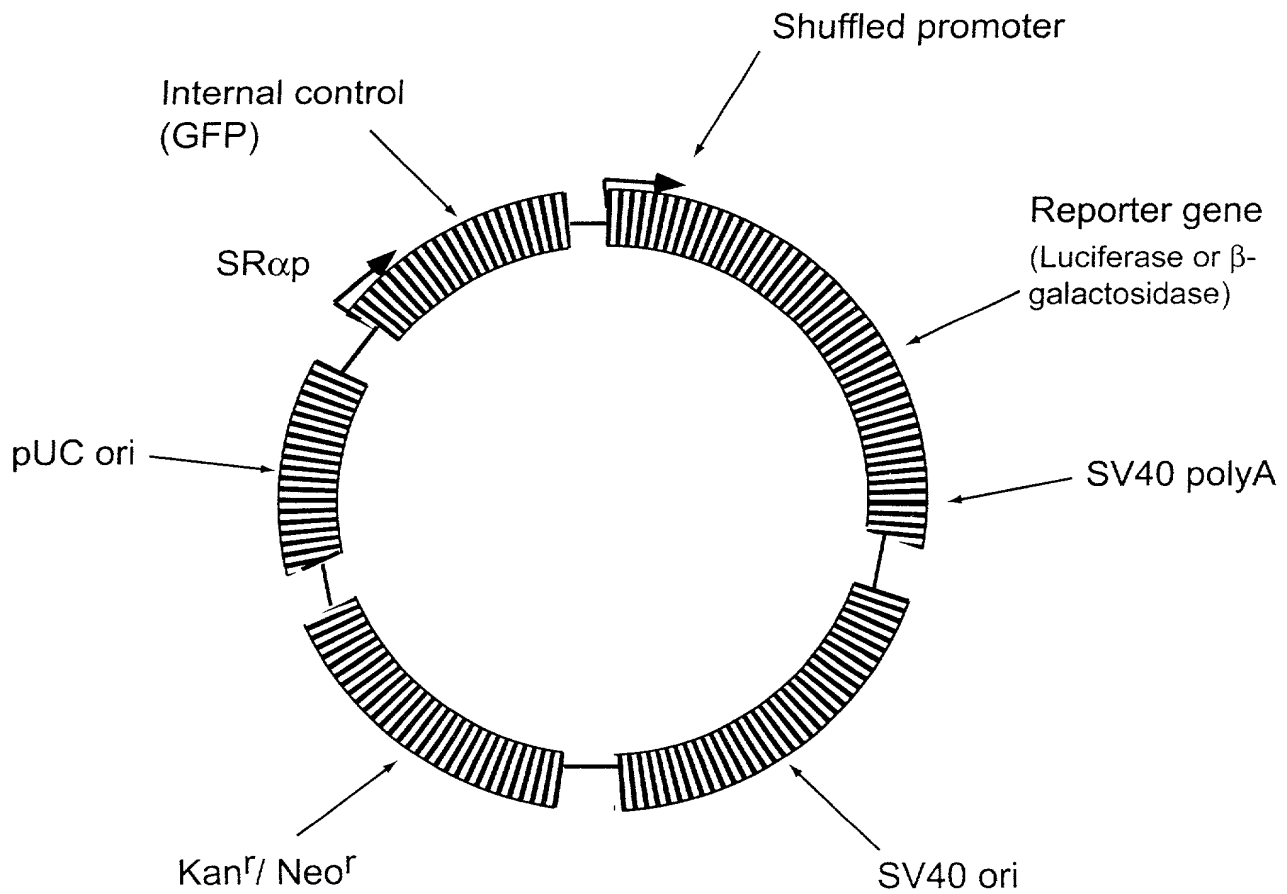


Fig. 9

Figure 10A

Towne_promoter_fr_PCR_prod_seq	1	60
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
	ATA....TGAGGCTATATCGCCGATAGAGCGACATCAAGCTGGCACATGGCCAAATGCAT	
	ACT....TGGCACGGTGCCAA.GTTTGGGGCGGGGTC...TTGGCACCGTGCCAA.....	
	ATTGAATTGGCATGTGTGCCAATAATGGCGGC..CATA...TTGGCTATATGCCA.....	
Towne_promoter_fr_PCR_prod_seq	61	120
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
	ATCGATCTATACATTGAATCAATATTGGCAATTAGCCATATTAGTCATTGGTTATATAGC	
	...GTCCGCCATATTGGTTTGGCAT.....ATGTCCAATATATTGAT...CCATATAGC	
	.....GGATCAATAT.....ATAGGCAATATC.....CAATTTGGC	
Towne_promoter_fr_PCR_prod_seq	121	180
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
	ATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATAATATGTACAT	
	CAATATCCAATATGGCTAATAGCCA.....GGTTCAATAGAAATGGCCAAATAAGC	
	CCTATGCCCAATATGGCTATTGGCCA.....GGTTCAATACTATGTATTGGCCCT	
Towne_promoter_fr_PCR_prod_seq	181	240
Rhesus_monkey_PCR_prod_821bp		
Vervet_(Simian)_PCR_product_seq		
	TTATATTGGCTCATGTCCAATATGACCGCCATGTTGACATTGATTATTCACTAGTT..AT	
	CAATAT..GCCATTGGCCAAACATGGCAA.TGGGCCAGTATTGATTATAGCCCAATAT..AT	
	ATGCCA..TATAGTATTCCATATATGGGTTTTTCCTATTGACGTAGATAGCCCCCTCCCAAT	

Figure 10B

Towne_promoter_fr_PCR_prod_seq	241	TAATAGTA.....ATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGC	300
Rhesus_monkey_PCR_prod_821bp		AGGCAATA.....ATCCATATTGG...CATATGTCCATATTGCCCTATAGCCATATTGGC	
Vervet_(Simian)_PCR_product_seq		GGGCGGTCCCATATACCATATATGG...GGCTTCCTAATACGGCCCATAGCCACTCCCCC	
Towne_promoter_fr_PCR_prod_seq	301	GT...T..ACATAACTTACGGTAAATGGCCCGCCTCGTGACCGCCCAACGACCCCGCCC	360
Rhesus_monkey_PCR_prod_821bp		TTATGT..CCATTACCAATACCATATATATGGGTCTTCTATATACGTTCATAGGTACCGCCC	
Vervet_(Simian)_PCR_product_seq		AT...TGACGTCAATGGTCTCTATATATATGGTCTTTCTTATTGACGTTCATATGGGCGGTCC	
Towne_promoter_fr_PCR_prod_seq	361	.ATTGACGT.....CAA	420
Rhesus_monkey_PCR_prod_821bp		.ATTGACGTAATATGGATACGCCCTCCATTGACGTCAATGGGAGGGATTAAATACGTCAC	
Vervet_(Simian)_PCR_product_seq		TATTGACGTA.TATGGCGCCTCCCCCATTGACGTCAATTACGGTAAATGGCCCGCCTGGC	
Towne_promoter_fr_PCR_prod_seq	421	TAATGACGTATGTTCCCAT.....AGTAACGCCAATAGGG..ACTTTC	480
Rhesus_monkey_PCR_prod_821bp		TAATACCGCCCATGACGTGTATAGGACCGTCCCATTTGACGTCAATAGGCCACCTCCCA	
Vervet_(Simian)_PCR_product_seq		T..CAATGCCCATTTGACGT.....CAATAGGACCCACCA	

Figure 10C

Towne_promoter_fr_PCR_prod_seq	481	TTGACGTC	540
Rhesus_monkey_PCR_prod_821bp		TTGACGTC	
Vervet_(Simian)_PCR_product_seq		TTGACGTC	
Towne_promoter_fr_PCR_prod_seq	541	ATCAAGTGTATCATATGCCAAGTCCGGCCCCCTATTGACGTCAATGACGGTAAATGGCCC	600
Rhesus_monkey_PCR_prod_821bp		.....CCACGCCCCCTATTGACGTCAATGACGGTAAATGGCC.	
Vervet_(Simian)_PCR_product_seq		.....TCACGCCCCCTATTGACGTCAATGACGGTAAATGGCC.	
Towne_promoter_fr_PCR_prod_seq	601	GCCTGGCATTATGCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATC..T	660
Rhesus_monkey_PCR_prod_821bp		.....CACTTGGCAGTACATCAAT	
Vervet_(Simian)_PCR_product_seq		.....CACTTGGCAGTACATCAAT	
Towne_promoter_fr_PCR_prod_seq	661	ACGTATTAGTCATCGCTATTACCATGGTGATCGGGTTTGGCAGTACACCAA.....	720
Rhesus_monkey_PCR_prod_821bp		ACCTATTAAATAGTAACT..TGGCAAGTAAATGGGTACTTGGCAGTACACCAAAGG.TACAT	
Vervet_(Simian)_PCR_product_seq		ATCTATTAAATAGTAACT..TGGCAAGTACATTACTATTGGCAAGTACGCCAAGGGTACAT	

Figure 10D

Towne_promoter_fr_PCR_prod_seq	721	.....TGGCGTGGATAGCGGT..TTGACTCACGGGGATTTC	780
Rhesus_monkey_PCR_prod_821bp		TGGCAG.TACTCCCATTTGACGTCAATGGCGGTAAATGGCCCGCAATGGCTGCCAAGTACA	
Vervet_(Simian)_PCR_product_seq		TGGCAGGTACTCCCATTTGACGTCAATGGCGGTAAATGGCCCGGCATGGCTGCCAAGTACA	
Towne_promoter_fr_PCR_prod_seq	781	...CACCCCATTTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCA	840
Rhesus_monkey_PCR_prod_821bp		...TGCCC.ATTGACGTCAATGGGG.....	
Vervet_(S-mian)_PCR_product_seq		ACATCCCC.ATTGACGTCAATGGGAA.....	
Towne_promoter_fr_PCR_prod_seq	841	AAATGTCGTAATAACCCCGCCCGTTGACGCAAAATGGCG.....	900
Rhesus_monkey_PCR_prod_821bp		.....CGTCCCTATGACGTCAATGGGCG.....	
Vervet_(Simian)_PCR_product_seq		.....GGGGCAATGACGCAAAATGGGCGTTCATTGACGTAAATGGCG	
Towne_promoter_fr_PCR_prod_seq	901	GTAGGCGTGTACGGTGGAGGCTATATAAGCAGAGCTCGTTAGTGAAACCGTCAGATCG	960
Rhesus_monkey_PCR_prod_821bp		GTAGGCGTGC.CTATGGGCGGTCTATATAAGCAATGCACGTTTAGGGAACCGCCATTCTG	
Vervet_(Simian)_PCR_product_seq		GTAGGCGTGCCTAATGGGAGGCTCTATATAAGCAATGCTCGTTTAGGGAACCGCCATTCTG	

## Figure 10E

	961	1020
Towne_promoter_fr_PCR_prod_seq	CCTGGAGACGCCATCCACGCTGTTTACCTCCAT.AGAAGACACCCGGG.ACCGATCCAG	
Rhesus_monkey_PCR_prod_821bp	CCTGGGACGTCG.....GAGGAGCACCAT.AGAAGTACCGGGGACCGATCCAG	
Vervet_(Simian)_PCR_product_seq	CCTGGGACGTCG.....GAGGAGCTCCATTGGAAGAGACCCGGG.ACCGATCCAG	
	1021	1057
Towne_promoter_fr_PCR_prod_seq	CCTCCGCGCGCGGAAACGGTGCAATTGGAACGCGGATT	SEQ ID NO:20
Rhesus_monkey_PCR_prod_821bp	CCTCCATAGCCGGGAAGGGTGCAATTGGAACGCGGATA	SEQ ID NO:22
Vervet_(Simian)_PCR_product_seq	CCTCCATAGCCGGGACGGTGCAATTGGAATGCGGATA	SEQ ID NO:23